

### Abstract

In a data switching system, the ingress and egress ports of a memoryless cross-bar switch are controlled by an arbitration method. The arbitration method uses a three phase process involving (i) a request phase in which  
5 each ingress port sends its connection requests to egress ports to which a connection is required, (ii) a grant phase in which each egress port uses a grant pointer to select one of the requests directed to it using a grant pointer, and generates a grant signal, and (iii) an accept phase in which each ingress  
10 port selects one of the received grant signals to accept, so defining an ingress to egress port connection across the cross-bar switch. The transition sequences for each of the grant pointers are mutually exclusive, so that any synchronisation of the grant pointers is eliminated on the next arbitration cycle. This is arranged by a setting of the paths taken by request and grant signals.

15 [Fig. 1]